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Functional Description: Information Management System for the Fort Polk, LA Directorate of Logistics

by
Donald K. Hicks
Michael J. Fuerst

The Directorate of Logistics (DOL) at Fort Polk, LA consists of about 20 buildings. The computerized management system presently used at Fort Polk requires operators to enter data during customer interviews, to consult paper files, to track work orders, to perform daily planning and control activities manually, and to write special reports and inquiries. This report presents functional specifications for a data base management system to better manage DOL equipment maintenance activities at Fort Polk. The described system would interface with presently used software, and would improve the current information management system by providing better capabilities for automated data entry and retrieval, user-defined report generation, networked data base information, and automated tracking of work orders through all stages of completion. This functional description can also be used for similar activities at other Army installations.

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The Directorate of Logistics (DOL) at Fort Polk, LA consists of about 20 buildings. The computerized management system presently used at Fort Polk requires operators to enter data during customer interviews, to consult paper files, to track work orders, to perform daily planning and control activities manually, and to write special reports and inquiries. This report presents functional specifications for a data base management system to better manage DOL equipment maintenance activities at Fort Polk. The described system would interface with presently used software, and would improve the current information management system by providing better capabilities for automated data entry and retrieval, user-defined report generation, networked data base information, and automated tracking of work orders through all stages of completion. This functional description can also be used for similar activities at other Army installations.

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FOREWORD

This study was done for the U.S. Army Forces Command (FORSCOM) under Reimbursable Order No. 76-87, "Directorate of Logistics (DOL) Consolidated Maintenance Facility, Third Party Financing, Fort Polk, LA," dated September 1987. The FORSCOM technical monitor was Mr. Edward Keagy, FCJ8-RE.

This work was performed by the Facility Systems (FS) Division of the U.S. Army Construction Engineering Research Laboratory (USACERL). The principal investigator was Mr. Donald K. Hicks. Dr. Michael J. O'Connor is Chief, USACERL-FS. The USACERL technical editor was Mr. William J. Wolfe, Information Management Office.

COL Everett R. Thomas is Commander and Director of USACERL, and Dr. L.R. Shaffer is Technical Director.

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A FUNCTIONAL DESCRIPTION OF AN INFORMATION MANAGEMENT SYSTEM FOR THE FORT POLK, LA DIRECTORATE OF LOGISTICS

1   INTRODUCTION

Background

The Directorate of Logistics (DOL) Maintenance Facility at Fort Polk, LA, consists of approximately 20 buildings. The computerized management systems used at the time of this investigation at the Fort Polk DOL are the Major Item Management System (MIMS) for production control and the Automated Retail Outlet System (AUTOROS) for inventory and supply.* (AUTOROS is also used outside the DOL.) Both systems require operators to enter information either during customer interviews (e.g., when items are brought in for maintenance services) or from prepared data forms. Some inputs, such as authorization confirmations, require consulting paper files. The reporting capabilities and options of the MIMS system satisfy routine upward reporting requirements, but further automation of the system could help to better support daily production planning and control, and the generation of special reports and inquiries. MIMS may also be improved by better error checking of input transactions.

Objective

The objectives of this study were to: (1) outline parameters for an automated data processing system that would improve efficiency in production control, inventory, and supply procedures, and (2) develop a functional description of a system that meets the needs of the Fort Polk DOL, and by extension, that will serve as a component that may result in greater efficiency for any DOL operation.

Approach

The existing computerized information management system at Fort Polk was reviewed and areas for improvement were identified. Based on this review, the requirements for a more fully automated system that meets the needs at Fort Polk were developed.

Scope

This document describes requirements for a proposed management system for Directorate of Logistics (DOL) at Fort Polk. The U.S. Army Logistics Center at Fort Lee, VA, is in the process of developing the Standard Army Maintenance System for TDA maintenance functions (SAMS TDA). It is planned that in several years, SAMS TDA will replace MIMS and will be designed to be the standard information management system for all TDA maintenance functions Army-wide.

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*Although these two options have been combined since this investigation, the functionality and features of both systems remain nearly the same.

2 GENERAL PERFORMANCE REQUIREMENTS

The general requirements for a data processing system to meet the needs of the Fort Polk DOL are:

1. Hardware: The system should operate on a microcomputer or small minicomputer in a multi-user environment, and should interface with MIMS and AUTOROS.

2. Access: Higher authorities shall have access to reports and data files generated, but not to the basic data.

3. Security: The entry of data, and the revision of system tables and codes should be possible only for personnel with a properly authorized password. Each password can be limited to access to a specific set of screens, data, and functions. For example, each shop foreman could be limited to accessing work orders and employee information pertaining to that foreman's shop, and access to selected system tables should be limited to certain employees.

4. Disk capacity: Disk capacity shall be the sole constraint on data base size.

5. User interface:

    a. The user interface for terminal data entry shall be menu, window, and entry screen-based, and shall be consistent in that any single key or sequence of keystrokes should perform the same or an analogous function throughout the program. Upon request, users should be able to scroll through choices of needed input codes.

    b. During input from the keyboard, the operator should be able to edit data for completeness, accuracy, and consistency with data that has been entered previously. Clear error messages or signals shall be produced to alert the user to errors.

    c. A help system should be accessible from all data entry fields. Displayed help screens should show the user textual explanations and/or a predefined or a data base-derived list of choices.

    d. An operator with keyboard skills who is familiar with recordkeeping concepts for asset management and maintenance should be able to master most features of the system within 2 days of training. Users familiar with basic computer operations should be able to learn to generate custom reports within 2 days of training.

    e. Delay time after user completion of a data entry field shall not exceed 0.25 s.

    f. Delay time after user completion of a data entry screen that does not define reports shall not exceed 10 s.

6. Software: Data base management software should provide maximum flexibility for custom queries and report generation. It shall have the following minimum capabilities:

    a. To add fields or expand field characteristics of an existing file without having to revise applications using that file (except to add, revise, or extract data from such new fields).

b. To derive custom reports by linking multiple data files, with record inclusion criteria based on multiple logical criteria on one or more fields from one or more of the files. The logical criteria should be user-definable at report time. Wild-card or pattern-matching criteria is considered a desirable feature. All derived files should be sortable by user-specified multitiered categories. Customized report formats must be savable for future use.

c. To incorporate and remove custom-designed reports into the report selection or other menu screens.

d. To display the progress of lengthy searches.

7. File compatibility: The system shall allow import and export of ASCII files to:

a. Initialize and modify data tables

b. Enter and revise work orders

c. Send data to other systems for upward reporting.

8. System networking: The system should handle multiple shops, the routing of work orders through multiple shops, and multi-inventory storage locations.

9. Bar code interface: Bar code readers should be used to the extent possible to minimize paperwork. Provisions must exist for any information which can be collected by bar code readers to be entered alternatively by keyboard. Any information downloaded from bar code devices should be tested for accuracy and consistency, as the operator will have the capability to make corrections interactively, before or after the downloaded information is incorporated into the system's data bases.

10. System integrity: All calculations shall be 100 percent error-free.

11. Backup and failure contingencies:

a. Each day, the data files of the fixed disk of the central computer should be backed up using consistent, well-defined procedures. Revolving backup media should be used, corresponding to each day of the week. Proposals should identify the hardware and media for backups.

b. The exact nature of a data recovery will depend upon the nature of the failure. A total failure of a fixed disk will require reloading the previous day's backup and re-creating the current day's activities from manual records. A corruption of portions of the data base will require checking each table or file of the data base and re-creating or augmenting the corrupted files and tables. Proposals shall specify recovery procedures.

c. For the duration of a system failure, manual methods shall be used. The system must provide for all resulting data to be entered after system restart, either by persons designated or by a data entry clerk.

3   SPECIFIC CAPABILITIES

The DOL information management system must perform a great number of specific data management tasks, including (but not limited to):

1.   Asset management

2.   Labor management (task definition, and management and planning of work orders)

3.   Vehicle maintenance (preventive maintenance [PM], the maintenance of vehicle maintenance histories and archives, and parts inventories)

4.   Purchasing

5.   Personnel functions - Each employee will have a bar coded identification badge that will replace the one time card. Each work center will have a bar code reader which will be used to keep track of the time and attendance per employee and the time spent on each task. Standards will be incorporated to provide comparisons between actual and allowable times. System will also be used to establish standards to make possible the generation of efficiency measurements for individuals and groups.

6.   The formatting and generation of data-related reports, via automated data collection devices.

Asset Data

1.   Asset management: Items to be repaired can be designated as end items or components. Although a specific type of item may have a default designation, this should be revisable for a specific work order.   Major end items designated locally, usually large vehicles such as tanks, trucks, and personnel carriers, can have their maintenance histories tracked.

2.   Data items: A noninclusive list of other data items shall be required to support work order management and history.   Specific data items may be needed for each type of asset.

      a.   Data for description of asset types:

          (1)   Equipment description (nomenclature)

          (2)   Equipment category code

          (3)   End item/component code

          (4)   Appropriate name plate information: rpm, psi, hp, kw, tons, cfm, ratio, frame, kva, gpm, volts, amps, sf, btu/hr, etc.

          (5)   Appropriate component/spare part information: motor type, pump type, filter type, belt type, etc.

          (6)   Default accounting code

(7) Maintenance repair code

b. Data for instances of an asset type, used only for asset types for which histories of instances are tracked:

(1) Equipment description

(2) Equipment/component identifier (serial number)

(3) License number (when appropriate)

(4) Manufacturer

(5) Model number

(6) Date installed

(7) Warranty expiration

(8) Operating hours or mileage (as appropriate) and date the reading was made

(9) Remarks

(10) Owning organization

(11) Default accounting code.

The system should be able to associate preventive or cyclic maintenance tasks with either a specific asset or type of assets.

Task Definitions

1. Data elements shall include:

a. Task ID

b. Task description

c. Materials associated with task

d. Default accounting code

2. General requirements: The system should allow:

a. Multiple tasks done to an asset by multiple shops to be easily combined into single work orders

b. Preventive maintenance schedules to be defined as combinations of tasks

c. Multiple PMs to exist for a single piece of equipment with different scheduling requirements

Work Order Management and Planning

1. The work order data base should contain:

a. Job number: Every work order must have a unique identification code (a job number). Document numbers shall be assigned by the Production, Planning, and Control Branch (PP&C) or generated automatically by the system. Initiators may optionally designate the first character of a job number as a specific alphanumeric character.

b. Requestor of work:

(1) Phone number or other means to contact requestor

(2) Date and time work order request received

(3) Date and time item delivered for work

(4) Equipment/component description

(5) Equipment/component identifier (serial number) (may not be applicable to all items): If the item's history is monitored, the equipment/component identifier is the key to other information on the item.

c. Quantity

d. Shop code(s) (work may be performed by multiple shops)

e. Tasks to be performed by each shop: Description of each task to be performed, which may be coded by a five-character alphanumeric code identifying the units of the task and the number of units.

f. Status code: The system should allow work orders to be assigned a status code, to be changed as needed during the life of the work order. Status codes shall locate work orders by stages of completion: in estimating, planning, approved, awaiting authorization, awaiting parts, awaiting labor, ready for shop, in process, complete, or by other user-defined codes. These codes shall apply to any shop listed on the work order. The system should then allow work orders to be selected by this code for reporting.

g. Remarks and special instructions

h. Accounting code

i. Priority

j. Other data items necessary to track the status of a work order, and to retrieve the time and materials charged against the work order. Information to meet the requirements for work order tracking and planning, described in subsequent sections, must be retained.

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2. Work order planning/scheduling capabilities. The system should:

    a. Allow multiple assets of a similar type on the same work order

    b. Allow review of an asset's maintenance history and upcoming PM requirements while preparing a work order or while performing work on an asset

    c. Automatically flag corrective work orders for items under warranty

    d. Assign priority codes for the work order

    e. Identify work orders on which work can begin as a result of parts or materials received

    f. Charge and reserve parts and materials to work orders.

3. Work done under contract: The system should be able to process work orders performed under contract, rather than by in-house staff, and charge them to appropriate accounting codes.

Preventive Maintenance

The system should have the capability (not now a requirement of DOL) to:

1. Schedule PM work orders by any one of the following:

    a. Set calendar date

    b. Time from last PM

    c. Metered usage

    d. Metered usage since last PM

    e. Any combination of these criteria

2. Allow designation of a lead period (time or metered usage) in which a PM may be scheduled

3. Print PM notices to owning organization, and record PM completions

4. Provide detailed descriptions of PM procedures on notices or work orders, if requested

5. Report on equipment for which required PM has not been completed.

Maintenance History and Archiving Capabilities

The system should:

1. Automatically update maintenance history at work order closeout

2. Offer a selective archive of history based on multiple select criteria

3. Maintain a detailed work order history by equipment for at least 1 year, and a summary maintenance history for each piece of equipment for 5 years.

Parts Inventory

1 Minimum list of data items:

   a. Description

   b. National stock number

   c Manufacturer's part number

   d. Acquisition advice code

   e. Item source code

   f. Exception data

   g. Vendor's part number

   h. Vendors for each part:

      (1) Point of contact

      (2) Company name, address, and phone number

      (3) Price

   i. Associated equipment items or assembly (if applicable)

   j. If item is stocked at one or more locations, for each location:

      (1) Maximum stock item

      (2) Reorder point and quantity (up to three of each to handle seasonal items)

      (3) Safety stock

      (4) Row, aisle, and bin

   k. Expected lead time

   l. Unit of issue

   m. Unit of measure

n. Unit of issue conversion factor

o. Shelf life code

p. Maintenance repair code

q. Demilitarization code

r. Accounting requirement code

s. Material advice code

t. Recoverability code

u. Essentiality code

v. Reportable item control code

w. Usage history

2. Capabilities: The system shall be able to:

a. Look up parts by part number or key word for part name

b. List both stocked and unstocked parts

c. Flag or delete parts that are no longer associated with any active equipment or facility, or that have not been used during the most recent user-designated time period

d. Maintain controls to prevent inadvertently deleting parts still associated with active equipment or facilities

e. Automatically reflect parts issues, charges, reservations, and returns in inventory

f. Track parts reserved or charged to work orders

g. Release or recover unused reserved parts at work order closeout

h. Track issues of parts and supplies not chargeable to specific work orders

i. Report on parts and supplies which need ordering, and generate purchase orders automatically on request

j. Process material receipts and issues through bar coding

k. Maintain multiple vendors or sources for each part

l. Upon demand, print bar code labels to place on parts or on parts boxes, containers, or bins (dedicated bar code printers may be used)

m. Assign parts to a work order by having a parts clerk or other authorized person either enter an appropriate part number or bar code associated with the part. A maintenance person can be authorized to bar code a part with a portable bar code reader.

n. Automatically calculate economic order quantities, reorder points, safety stock levels, and expected lead times. Users shall have the ability to revise these manually when desired.

o. Define parts sets for specific tasks. For each parts set, the system should allow the quantity of each part and whether the part is mandatory to be specified.

Purchasing

1. The system shall maintain the following data elements for purchase orders:

   a. Order number

   b. Date order initiated

   c. For each item ordered:

      (1) National stock number

      (2) Manufacturer's stock number

      (3) Description

      (4) Quantity (in terms of unit of issue)

      (5) Work order awaiting the part

      (6) Date of last status check

      (7) Result of last status check

2. The system shall:

   a. Generate purchase requests to the in-house government supply system. Such requests must be on appropriate forms or their equivalents, and/or placed on a file for transfer to the Standard Army Intermediate Level System (SAILS) or other designated Army supply systems.

   b. Generate purchase orders to outside suppliers

   c. Print purchase orders for unstocked items when needed upon request

   d. Allow for manually created purchase orders

   e. Tag work orders which depend on the purchase order

f. Produce queries to and accept data from SAILS or other government systems concerning status of purchase requests.

Employee Management

1. Data elements needed for each employee are:

    a. Name

    b. Address

    c. Phone

    d. Employee number

    e. Job title

    f. Pay grade

    g. Hourly rate

    h. Overtime rate

2. The system shall have the capability to:

    a. Charge labor of each employee to work orders on a 1/10th-hour basis. Provide entry of nonproductive time into system (such as lunch, breaks, travel time, administrative, training, cleanup, sick leave, vacation, overhead, holidays). The classifications of nonproductive time shall be user-specified. By user-set options, each type of nonproductive work should be either (1) charged directly to work orders, apportioned to the day's or week's work orders according to hours worked, or (2) charged to an overhead or nonproductive time account. Administrative and managerial employees' time shall be chargeable to one or more nonproductive time classifications.

    b. Record in advance planned vacation, holiday, and sick leave entries, so that employees are not considered available for these periods.

    c. Have maintenance personnel enter daily time reports via bar code data entry stations. Each station shall consist of a bar code wand or a laser reader connected to a keyboard with a one- or two-line text display, which shall be used to prompt the maintenance personnel for appropriate inputs to complete a transaction. Each data entry station, or the controller for the network of stations, shall have a built-in clock to record the time of each input transaction.

    d. Allow employees with access and authorization to use the data entry work stations. They shall have one or two laminated sheets with the necessary bar codes or other instructions to record the following:

        (1) Time employee started and stopped on work orders, and tasks within work orders

        (2) Nonproductive time: category, when started, when stopped

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(3) Equipment or component failure codes (for corrective work only).

The data entry stations must be programmable to ensure that employees enter the correct sequence of entries for a transaction.

Budgeting and Workload Planning

The system should allow the establishment of annual and quarterly budgets and provide reports comparing expenditures to budgeted amounts. In particular, the system should:

1. Project labor hours needed by craft and/or shop for any future time period of time, based on past history

2. Project labor hours available in a week by craft, considering known and projected absenteeism and leave, expected emergencies, expected overtime, work already assigned, and expected contract labor hours available

3. List work orders available for working at each shop, and propose priorities among them, according to user-defined rules. These priorities are not binding on the production planners.

Reports and Inquiries

The system must have the capability to collect and analyze the data necessary to produce needed reports and/or on-line inquiries (as appropriate). The scope of each report should be definable by the user. Minimum requirements for predefined reports and inquiries, which neither eliminate nor substitute for the requirements for user-definable reports, are:

1. Equipment reports:

   a. Details of any piece of equipment whose history is maintained

   b. Parts list for any piece of equipment

   c. List of equipment associated with a part

2. Maintenance reports:

   a. Past due work orders

   b. Work orders awaiting planning or deferred

   c. Work orders awaiting scheduling

   d. Active work orders by user-defined criteria

   e. Work order backlog by craft code (expressed as number of work orders and/or estimated hours)

f.　Equipment cost histories by individual equipment and by categories of equipment

g.　Weekly, monthly, and quarterly status and closeouts

3.　Inventory-related reports:

a.　Inventory catalog by part or by location

b.　Parts in need of reordering

c.　Past due purchase orders

d.　Parts usage reports for any time period

e.　Parts for equipment no longer a part of the equipment inventory

4.　Purchasing related reports:

a.　Parts/supplies in need of reordering

b.　Print purchase orders if requested

c.　Open purchase requests in summary and detail form

d.　Past due purchase orders

e.　Status of blanket open-purchase agreements

f.　Year-to-date purchases from each supplier

5.　Employee management:

a.　For any employee or group of employees for any period of time, the time spent in various categories of productive and nonproductive work activities.

b.　Differentiate between normal and overtime hours, and assign costs to work orders accordingly.

6.　Work forecasting:　Those data items necessary to satisfy the work-forecasting requirements described above.

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4   DATA AND MATERIEL FLOWS

Once the DOL information management system is established, the flow of data and materiel will follow defined channels, including the creation of a work order request, the acceptance or rejection of the request, and the location, ordering, and receipt of parts and issues.

Creating a Work Order Request

A work order request is created when an authorized person enters enough information into the system at a computer terminal to complete the equivalent of a DA Form 2407 (Maintenance Request). The system completes and/or suggests defaults for as much of this information as possible.

Work order requests are created at a terminal at one of the following locations:

1. CMF (Consolidated Maintenance Facility) access point
2. RXA (Repair Exchange Allowance)
3. 705th Support Battalion
4. 5th Support Battalion
5. 105th Support Battalion.

Each unit or battalion has one or more persons designated to submit pending work orders. Each may submit work order requests up to an authorized priority. The system maintains an internal table to track all authorizations.

At these locations, work order requests are created either by a clerk interviewing a unit representative, or directly by a unit representative at a computer terminal. Unit representatives are trained to know what information they must have ready to create a work order request.

Upon successful entry of all information for the work order request, a 2407 equivalent (three-ply copy) is printed locally. This will include instructions for where in the CMF to take the items. The top sheet will have a bar code with the document number of the work order request. Several bar code labels identifying the job will be printed at this time.

A work request becomes a work order when its status is "awaiting scheduling." The system cancels any pending work order if the equipment is not submitted within 24 hours.

Item Acceptance by DOL Maintenance From Unit Representative

1. The unit representative takes the 2407 equivalent, bar code labels, and the item to the appropriate location in the CMF.

2. Each work area in the CMF has one or more "acceptors" authorized to accept equipment from unit representatives. A production controller, shop foreman, or craftsperson may be so authorized. The bottom copy of the 2407 is issued to the unit representative as a hand receipt.

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3.   The acceptor may reject a work request if the item is severely abused, involved in an accident, missing any major components, or requires work that DOL maintenance is not authorized to perform. The work request will be canceled automatically within 24 hours, unless the item is resubmitted with proper special authorization.

4.   If the acceptor accepts the item, the status of the work order request depends upon the nature of the item. For example, work order requests for large equipment will be classified as awaiting inspection, but furnishings, communications equipment, and clothing will usually be designated as awaiting scheduling (and thereby become valid work orders). The acceptor of the item is responsible for updating the status correctly.

Opening a Work Order for Work

1.   Production controllers determine which work orders are to be done, and they change the work order status. (Inspection is a type of work.) Selected shop personnel may also have authority to change status for jobs in their shops.

2.   Shop foremen and/or production controllers assign employees to the work order.

3.   The employee opens the work order by bar coding his or her badge number and the work order number. (The work center is known from the bar code terminal or the employee's work center.)

Initial Inspection

Initial inspections are most often done on vehicles and other heavy equipment, rather than on small items such as radios or clothing. Initial inspection may be performed by an inspector, foreman, or designated mechanic. (This report will use the term "inspector" for any person performing inspection.) The steps in the initial inspection are:

1.   The inspector opens the work order.

2.   The inspector determines through which work centers to route the item, and what tasks will be performed at each work center. (Each work center identified creates an internal work order, tracked by the combination of work order number and work center code.) This information is bar coded or otherwise entered into a terminal.

3.   The inspector may also reject the work order if abused or missing components are detected.

4.   Data entry will based on standard codes and categories: work center codes, list of task procedures (sets of tasks or major tasks, such as rebuilding an engine), major types of tasks (e.g., to repair or replace), and common components on which major tasks are performed. Bar coding will be done from no more than two laminated sheets containing the codes appropriate for the work center.

5.   For standard tasks, the inspector may identify needed parts, and annotate the work order for needed repairs.

6.   After inspection, the work order is designated as awaiting authorization for each scheduled work center.

Rejected Work Orders

If the work order is rejected prior to physical acceptance of the items, the unit representative takes the item, and the acceptor designates the work order as canceled. If the work order is rejected during initial inspection, the work order is designated as rejected, and the unit is notified to pick up the item.

Identifying and Locating Parts

Parts may be identified during initial inspection or while a mechanic is working on an item. Parts needed for rebuilding of common components and items (e.g., engines, transmissions, flyer helmets, or radios) or for upgrade programs, should be available from stock 98 to 100 percent of the time, and are delivered to the shop before a mechanic is assigned to the work order. Jobs that are awaiting parts may have a 15 to 20 percent deadline rate.

1.   Identifying parts: The employee (inspector or repair person, depending on the item and work center) identifies parts either as a predefined set of parts (parts set) associated with a specific task (such as a transmission rebuild), or as a specific part number. Specific part numbers may be available from predefined lists of common parts, or obtained from someone with personal knowledge, from shop records, or from a technical manual. Parts are identified by the NIIN (the last nine digits of the National Stock Number (NSN) or locally defined NSN formatted number) for each part needed, or, if the NIIN is unknown, the manufacturer's part number. The employee identifying the parts may do one of the following:

a.   Select parts and quantity (by blackening circles or making other appropriate marks) from a preprinted list of commonly used parts. A bar code label placed on the sheet identifies the sheet with a specific work order. Special parts are written on a separate sheet. Production control inserts the marked predefined lists into an optical mark scanner for transfer into the computer. Production control can design preprinted lists for jobs commonly performed, such as rebuilding a specific type of engine or transmission.

b.   Make handwritten lists of parts only for nonstandard parts and for jobs that do not have preprinted parts lists. These handwritten lists shall also have an identifying bar code attached. Production control will key in handwritten lists of parts.

c.   Enter a backup directly into a computer system by bar coding or typing it in.

2.   Locating parts:

a.   If the NSN, NIIN, or manufacturer's part number is given, check the data base containing both stocked parts and parts which have been ordered in the past 2 years.

b.   If the item is identified as stocked:

(1) If the correct quantity of the part is in inventory and not reserved, reserve the correct quantity of the part.

(2) If the correct quantity of the part is in inventory, but some or all of the needed quantity is reserved, the production controller may reassign parts.

(3) If the reduction in inventory sends the quantity below the reorder point, augment the file for daily items to be reordered.

NOTE: If the job is of low priority, the part cannot be reserved or used if the resulting quantity causes stock to fall below the safety stock level.

c. If the item is not stocked, and the NSN or NIIN is known:

(1) Seek the part on the DOL's Catalog Master Data File (CMDF), the file of unstocked parts which the DOL has ordered in the past 2 years.

(2) If the part is not on the DOL's CMDF, seek the part on the installation's CMDF. If possible, download the installation's CMDF to the DOL.

d. If the item is not stocked, and only the manufacturer's part number is known, search the Army Master Data File (AMDF), the Army's catalog of all parts in its supply system. The AMDF search may require first finding the manufacturer's identification code. AMDF will be local on an optical disk.

Determining How Parts Will Be Ordered

1. If an unstocked part is found in the DOL's CMDF:

a. If the Item Source Code is D for RXA, obtain the part from direct exchange, and generate a 2765-1 and transmit it to RXA.

b. If the Item Source Code is B for Benchstock, obtain the part from shop stock inventory.

c. If the Item Source Code is E for Self Service Supply Center (SSSC), get the part from SSSC; if one exists on post, generate a DA 2765-1 ("Request for Issue or Turn-In") and send it to SSSC.

d. If the Acquisition Advice Code indicates local purchase, generate a DD Form 1348 (DOD Single Line Item Requisition System Document) and create a record for a SAILS tape; determine whether the part can be cannibalized or fabricated; and if the part must be fabricated, have a local source do so.

2. If an unstocked part is found in AMDF, or if the part is a stocked part which is out of stock and not back-ordered, generate a 1348 and record for a SAILS tape.

Review Availability Report for Needed Parts

The computer reviews availability and determines whether the parts are in stock, and, if not, determines how parts can be ordered. The production controller reviews this information and determines whether parts are to be ordered. If parts are available, the work order is automatically classified as awaiting authorization. If any parts were not found, the production controller confers with a shop foreman, mechanic, or inspector to identify the part correctly. If the part must be cannibalized or fabricated, the production controller confers with the cannibalization point and/or other shops to determine what is

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to be done. The production controller then decides whether the work order is to continue. If so, the parts are ordered or reserved, any work orders to fabricate are initiated, and the work order is designated as awaiting parts.

Responsibilities of Production Controllers

Production control teams of two or three persons will exist in each of four locations in the Consolidated Maintenance Facility. Adding these teams will result in a different, more efficient organizational structure. The automated system supporting DOL operations must recognize the teams' functions and accommodate them in the system. The duties of the teams include the following:

1. Determine, with the assistance of shop foremen and the production control branch chief, which work centers should work next on a particular work order.

2. Assign work orders for inspection and for work to shops according to technical requirements, parts availability, and priorities set by the production control branch chief. A single work order can be in use at more than one shop.

3. For some shops, physically accept items.

4. Research information necessary for parts orders.

5. Order parts, monitor parts orders, and initiate parts order queries.

6. Prepare reports as management requests.

7. Initiate orders for benchstock.

Parts Receipts and Issues

1. When parts orders are received, warehouse personnel enter the order number and part numbers into the computer, and store the parts in appropriate locations. Any parts ordered for a specific work order number can be stored in a holding area for that work order. The system generates SAILS records to acknowledge receipt of parts.

2. A bar code label can be generated and attached to parts received.

3. The warehouse area automatically receives reports identifying which work orders are ready for work, and collects the parts needed. All parts are issued to a specific work order unless the part or material has been designated as benchstock.

Cannibalization Area

1. Each piece of equipment turned over to the cannibalization area is recorded as such.

2. For each component removed from a cannibalized piece of equipment, the equivalent NSN, the job order, and the serial number of the piece of equipment from which it has been removed is recorded.

5   DATA QUANTITIES AND ESTIMATED COSTS

The system must handle up to 200 employees, and 4000 work orders per month, each of which goes to any number of work centers. Each shop may have foremen and repair persons.

1. Hardware (including support software):

20 bar code work stations on shop floors (five repair persons per station) @ $1500 each	=	$30,000
One AT-compatible to receive transactions from bar code work stations @ $2500	=	2500
One transaction processor @ $4000	=	4000
One file server with a 200M hard disk @ $8000	=	8000
One tape backup @ $2000	=	2000
13 diskless work stations @ $700 each	=	9100
Two in each of four production control areas		
One for production control chief		
Two for work order clerk/typists reporting directly to production control chief		
Two in warehouse/supply area		
12 bar code wands for 12 of 13 diskless work stations @ $400 each	=	4800
Five bar code printers @ $1700 each	=	8500
Six dot matrix printers @ $600 each	=	3600
Four optical mark scanners @ $3000 each	=	12,000
14 network boards @ $400 each	=	5600
Cabling, 3000 ft @ $1 per foot	=	3000
Miscellaneous hardware	≈	3000
Installation	=	12,000
TOTAL HARDWARE COST:		**$108,100**

2. Software:

Software to program bar code station network	=	1500
Four copies of software for optical mark scanners @ $500 each	=	2000
Network software	≈	2500
Communications/emulation software for Burroughs terminals	=	700
Software development costs	=	60,000
Data base software and other utilities	=	3000
TOTAL SOFTWARE COST:	=	**$69,700**
TOTAL HARDWARE AND SOFTWARE COST:		**$177,800**

(NOTE: Date of estimate was May 1990)

6 SUMMARY AND RECOMMENDATIONS

This report has described the requirements for an information management system for the DOL at Fort Polk, LA. The described system would interface with presently used software and would improve upon the current information management system by providing better capabilities for automated data entry and retrieval and user-defined report generation. Such a system would eliminate paper-intensive recordkeeping by routing data base information to multiple locations and by tracking work orders through all stages of completion. By partially or totally automating recordkeeping and tracking procedures, the flow of data and materiel would become more efficient, requiring that fewer people be assigned to these tasks.

It is recommended that the Fort Polk DOL and similar DOLs implement and monitor a system with the capabilities described in this report; document the return on investment that results from using this system; and publish and distribute the results of the experience.

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